Laboratory Operations

Because safe, secure, and efficient operations are an integral part of Livermore's research and development programs, responsible stewardship of the Laboratory entails setting high standards in all aspects of operations. Together, quality operations and scientific and technical excellence make possible Livermore's programmatic accomplishments and sustain public trust in the Laboratory.

Safety and security are the most important considerations in day-to-day operations. The Laboratory provides employees and neighboring communities with a safe and healthy environment in which to work and live. All employees hold a personal commitment to the safety of their work and of the individuals around them. The Laboratory is continuously improving systems in place to assure that proper safety practices are learned and followed by all. Security, also the responsibility of every employee, requires vigilance. Nuclear materials, sensitive information, and other valuable assets must be protected against new and evolving threats.

Business processes and systems, infrastructure management, and administrative functions are continually being improved to achieve best-in-class among high-technology research organizations. The demand is greater than ever before to improve efficiency and cut costs while maintaining compliance in an increasingly complex regulatory environment. A strategic, institutional view is needed to set priorities regarding where and how to improve work processes. A major challenge is effectively measuring performance to gauge success and providing quality assurance to Laboratory and contract managers, government officials, and the general public.

Safety is Number One

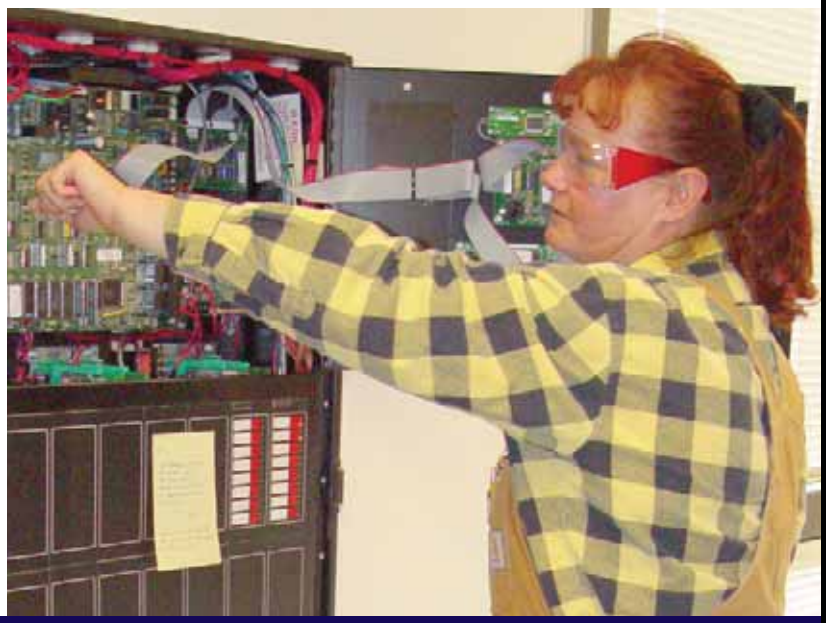
The Laboratory has put into place effective systems and procedures to assure that safety standards are met. Through the Integrated Safety Management System (ISMS), safety procedures and practices have markedly improved, as has safety performance. An audit report from the Department of Energy's (DOE's) Office of Independent Oversight and Performance Assurance (OA-40) in January 2005 states that "Managers and staff demonstrated a strong commitment to safety and reducing injuries and operational events. Most work activities observed were performed with a high regard for safety."

Illness and injury rates continue to decline at the Laboratory. For fiscal year 2005, the rate for recordable cases (number of cases per 100 employee-years) was 2.45 percent, and the rate for cases with days away, restrictions, or job transfers was 0.72 percent. These rates are comparable to those of best-in-class companies. In the area of electrical safety, Livermore's safety program has been identified by DOE as a model for the entire nuclear weapons complex. Excellence in safety is exemplified by the National Ignition Facility's five-year record of more than 4.5 million consecutive hours of work without a lost work day from an on-the-job injury. Plant Engineering crafts personnel have also worked more than 1.6 million consecutive shop hours without a lost work day.

A commitment to safety at all levels of management and by every individual is key to continuing success. The institution and each of the directorates are improving their abilities to identify their own weaknesses, analyze safety implementation, and develop effective corrective actions. The Laboratory has enhanced its self-assessment requirements to ensure more consistency, rigor, and oversight. Line managers are conducting observations of working-level activities to help identify improvements to the implementation of ISMS. In addition, a new Office of Institutional Performance Analysis was established to develop and communicate timely information to facilitate more effective management decision making, prevent recurring events, and improve efficiency.

Livermore has strengthened the safety of its nuclear facilities. The Laboratory stood down the Plutonium Facility (Building 332, also known as the Superblock) to assess all activities, develop new tools and processes, and implement rigorous protocols for resuming work. As a result of this effort and the cooperative support of the National Nuclear Security Administration's Laboratory Site Office (NNSA LSO), the Superblock

Safety comes first for crafts personnel at the Laboratory, who have worked more than 1.6 million shop hours without a lost work day.



Livermore's program for electrical safety has won accolades from DOE.

has returned to operation. An integrated, resource-loaded schedule has improved communication and the timely implementation of essential projects as priorities evolve. Another major nuclear facility at the Livermore site, Building 251, was successfully decommissioned (see p. 37). In addition, the Laboratory is pursuing all actions required to ready the Device Assembly Facility at the Nevada Test Site as a Category 2 Nuclear Facility. The Device Assembly Facility is managed by Livermore for NNSA.

The DOE Office of Independent Oversight and Performance Management (OA-30) recognized improvements to the Laboratory's Emergency Management Program. Their June 2005 report stated that Livermore "…has developed a rigorous framework for the emergency management training, drill, and exercise program." The performance demonstrated in the Laboratory's 2005 emergency response exercise and post-exercise improvements give confidence that Laboratory workers and the public would be protected from potential consequences of an incident involving hazardous materials.

Security Improvements

Security was enhanced after the September 11 attacks, and Livermore now operates routinely at a heightened security level. An extensive security apparatus is in place, and adjustments and upgrades are continually made to address new threats and concerns. The LSO's *2004/2005 Annual Safeguards and Security Survey of Lawrence Livermore National Laboratory* gave Livermore a Satisfactory rating, the highest rating possible.

Effective implementation of Livermore's Integrated Safeguards and Security Management (ISSM) helps to ensure that security is a top priority for all employees. Individual and collective responsibilities for safeguards and security are made clear to Laboratory personnel, who are required to complete necessary training. Line management in each directorate is accountable for performance and conducts an annual self-assessment in the areas of classified removable electronic media, locks and keys, security incident prevention, and implementation of ISSM.

The Laboratory is making continual improvements in cyber security, material control and accountability, counterintelligence, and physical protection. In particular, the Protective Force Division is staffing up and has implemented an alternate work schedule to reduce overtime. The division's overall operational readiness metric, which measures staffing, tactical training, overtime, equipment, and fitness, continues to improve. In 2005, the metric exceeded the Laboratory's internal goal of 85 percent. Equally important, an NNSA validation team described Livermore's use of technology to meet threat requirements as "best in complex."

Responsible Environmental Management

The Laboratory's commitment to environmental management is exemplified by the receipt of two

These newly graduated protective service officers add to the staff that provides physical security at the Laboratory.

The Decontamination and Waste Treatment Facility helps ensure that the environmental impact of Laboratory waste is minimal.

Pollution Prevention awards from DOE/NNSA in 2005. One award was for instituting a rigorous system for characterizing a waste stream, segregating acutely/extremely hazardous materials, and certifying the residual as low-level waste. By means of this system, the Laboratory has been able to divert about 44 percent of its waste (by mass) from mixed waste to low-level waste, which can be disposed of at the Nevada Test Site.

With support from Livermore staff, DOE completed the *Site-Wide Environmental Impact Statement* for continuing operation of the Laboratory. The Laboratory also integrated the International Organization for Standardization (ISO) 14001 environmental management system into ISMS. Academic, manufacturing, and government organizations worldwide have been adopting ISO 14001 as an effective management tool to help them analyze, measure, control, and minimize potential environmental impacts from their operations.

Livermore's environmental management efforts include remediation of groundwater contaminated many decades ago and disposal of legacy waste. In fiscal year 2005, Livermore met all negotiated, enforceable environmental restoration milestones as agreed to under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). In addition, 682 drums of transuranic (TRU) waste were removed from the Laboratory site. This legacy TRU waste had accumulated during decades of weapons program activities. Working in partnership with DOE, Livermore shipped this material to the Waste Isolation Pilot Plant near Carlsbad, New Mexico. The operation included 18 shipments with drums packed in specialized containers that weighed more than 7,000 kilograms.

In with New Facilities, Out with the Old

Construction of the $91-million Terascale Simulation Facility was completed well ahead of schedule and within budget. Occupation and activation of the building were completed in spring 2005. The 253,000-square-foot facility is home to the Laboratory's two large classified

BlueGene/L was one of two supercomputers installed in the new Terascale Simulation Facility.

supercomputers, ASC Purple and BlueGene/L (see p. 9); an advanced simulation laboratory for development of data assessment hardware and software; and offices for up to 288 staff members. The expeditious move of personnel and equipment to the new building was accomplished with no safety or security incidents. The move resulted in only short (one- to two-day) network-wide downtimes for unclassified and classified Livermore computing customers.

A nearly three-year effort to clean up Building 251, the Heavy Element Facility, reached a major milestone in April 2005 when the structure's status was downgraded from a Category 2 Nuclear Facility to a Radiological Facility. This change will save the Laboratory more than $250 million. No longer needed for heavy-element research and support for nuclear testing, the building had been on standby status since 1995. Nevertheless, significant upgrades would have been necessary to bring the facility into compliance with new requirements for a Category 2 Nuclear Facility.

Livermore met the deadline to downgrade the facility by April 10, removing stored heavy-element materials, 40 glove boxes, and associated ventilation systems. Altogether, the team removed 487 waste parcels packaged in 84 TRU waste drums, 38 Minimal Detectable Activity waste parcels, and more than 110 other items. The project was completed with virtually no safety incidents.

Cleanup of the Heavy Element Facility allowed its status to be downgraded to a Radiological Facility, saving the Laboratory millions of dollars.

Firefighters in Action

Suppressing a wildfire in the Altamont Hills that began during the evening of July 19, 2005, required 650 firefighters from the Laboratory, California Department of Forestry, the cities of Livermore-Pleasanton and Tracy, and Alameda and San Joaquin counties. They fought overnight to put out the fast-moving blaze, which grew to 10,000 acres and spread onto Site 300, the Laboratory's experimental test facility 15 miles southeast of the main Livermore site.

Laboratory firefighters Arnie Brockmire (left) and Kenneth Rinna spent two weeks in New Orleans rescuing survivors of Hurricane Katrina.

No facilities at Site 300 were damaged, and no one was injured. The fire station at Site 300 is staffed to handle such events, and the coordinated response to the fire ensured that the Laboratory's personnel and facilities were well protected. The Alameda County Fire Department served as incident command, operating out of the Site 300 fire station.

After Hurricane Katrina struck, two Laboratory firefighters were part of a 14-member squad from various Alameda County fire departments sent to New Orleans. In more than two weeks of assistance, the squad performed more than 980 rescue missions, including rescuing 100 children separated from their parents. The Laboratory's firefighters were sent in response to a Federal Emergency Management Agency request for swift-water rescue

Livermore's business practices and systems are continually being improved, with a Process Improvement Initiative serving as catalyst.

personnel. Staff from the Health Services and Hazards Control Departments were also deployed to provide medical assistance to evacuees.

Efficient and Effective Business Practices

The Laboratory's business systems—procurement, property management, and finance—are designed around best-in-class business practices and applicable federal regulations. Each area has performance management programs in place that include metrics and performance thresholds, which were developed in concert with NNSA and the University of California. Of particular note, Laboratory Procurement underwent an independent system assessment in August 2005 by a Procurement Evaluation & Engineering Team composed of NNSA officials and contractors. The team identified eight best practices, many procurement operation strengths, and no significant findings. In addition, 17 audits and reviews of Livermore's financial management practices were conducted by various internal and external organizations. No significant deficiencies were identified.

Business processes and systems are continuously improved to increase effectiveness and lower overall institutional administrative costs. Taking advantage of information technologies, the Laboratory is re-engineering many processes, including the development of new electronic systems for travel reimbursement, purchase ordering, account management, and recruitment and hiring. A Process Improvement Initiative, now in its second year, is serving as a catalyst to stimulate continual improvement as a shared Laboratory value. Livermore staff members trained in process improvement methods are assisting organizations that have identified key opportunities and needs for process improvement, helping to increase efficiencies and lower costs.

With an eye on future needs and requirements, the Laboratory is also investing in business projects that will transform the way work is done. One management initiative is the People Information Program, which will consolidate personnel information into a single database to enhance human-resource administrative functions at the Laboratory. Estimated operational savings will exceed $15 million per year when the project is fully implemented in two years. A second major effort, the Enterprise Project Accounting and Reporting (EPAR) Project, is in the initial development phase. When completed, EPAR will give Laboratory project and program managers a comprehensive, integrated toolkit for meeting planning, tracking, and reporting requirements. EPAR is expected to save the Laboratory about $19 million per year.